Sub C. Cont

an ink supply device mounted to said carriage for supplying ink to said recording head, wherein said ink supply device is constructed as a differential pressure valve including a coil spring, a valve seat and a movable membrane normally contacted elastically with said valve seat by said coil spring;

B1 Cont.

wherein said valve seat obstructs the flow of ink and only allows ink to flow around the valve seat when the movable membrane is disengaged with the valve seat; and

wherein said coil spring is located opposite the valve seat with respect to the movable membrane.

12. (Twice Amended) An ink supply unit, comprising:

a differential pressure valve including a coil spring and a movable membrane normally contacted elastically with a valve seat by said coil spring, is accommodated in a container having an ink storage chamber and an ink supply port;

B2

wherein the ink storage chamber communicates with the ink supply port;

wherein the ink supply port is adapted to be connected to an ink-jet recording head;

wherein said valve seat obstructs the flow of ink and only allows ink to flow around the valve seat when the movable membrane is disengaged with the valve seat; and

wherein said coil spring is located opposite the valve seat with respect to the movable membrane.

Sub. Cont

22. (Amended) An ink supply unit according to Claim 12, wherein:

B3

said movable membrane includes a movable part made of soft material, and a fixing part made of hard material and fixed to a periphery of said movable part.

46. (Twice Amended) The ink supply unit according to Claim 19, wherein:

B4

a film member having both gas permeability and ink repellent properties is interposed between said capillary and said ink storage chamber.

Please add the following new claims:

72. (New) An ink-jet recording device comprising:

a body;

a carriage movable relative to the body,

an ink-jet recording head provided to said carriage, and

B5

an ink supply device mounted to said carriage for supplying ink to said recording head, wherein said ink supply device is constructed as a differential pressure valve including a coil spring, a valve seat and a movable membrane normally contacted elastically with said valve seat by said coil spring;

Sub Cont

wherein said valve seat obstructs the flow of ink and only allows ink to flow around the valve seat when the movable membrane is disengaged with the valve seat; and

wherein the valve seat is stationary.

73. (New) An ink supply unit, comprising:

a differential pressure valve including a coil spring and a movable membrane normally contacted elastically with a valve seat by said coil spring, is accommodated in a container having an ink storage chamber and an ink supply port;

B5 cont.

wherein the ink storage chamber communicates with the ink supply port;

wherein the ink supply port is adapted to be connected to an ink-jet recording head;

wherein said valve seat obstructs the flow of ink and only allows ink to flow around the valve seat when the movable membrane is disengaged with the valve seat; and

wherein the valve seat is stationary.

74. (New) An ink-jet recording device according to Claim 1, wherein:

a main tank is mountable to said carriage, and adapted to be attached to and detached from said ink supply means.

75. (New) An ink-jet recording device according to Claim 1, wherein:

Sub Cont'd

a main tank is provided with a connection port; and said container is provided with a hollow member insertable into said connection port with a fluid-tight state maintained.

76. (New) An ink-jet recording device according to Claim 8, wherein:

said connection port is provided with valve means for normally sealing said connection port by a spring, and opening said connection port upon insertion of said hollow member.

B5 Cont.

77. (New) An ink-jet recording device according to Claim 7 or 8, wherein:

said main tank is divided into plural chambers by a partition or partitions, each provided with a communicating hole in a lower part thereof.

78. (New) An ink supply unit according to Claim 12, wherein:

a filter is arranged in an upstream side with respect to said differential pressure valve.

79. (New) An ink supply unit according to Claim 12, wherein:

said coil spring is contacted with said movable membrane via a holder having an ink flow hole located to face an ink flow port of said movable membrane.

Sub C (cont)

80. (New) An ink supply unit according to Claim 12, wherein:

said valve seat is formed as a spherical surface protruded toward said movable membrane.

81. (New) An ink supply unit according to Claim 12, wherein:

a protruded part is formed on a surface of said valve seat where it is contacted with said valve seat.

B5 cont.

82. (New) An ink supply unit according to Claim 12, wherein:

said valve seat is formed as a protruded part having a planar surface on a side toward said movable valve.

83. (New) An ink supply unit according to Claim 12, wherein:

said movable valve includes a disc-like movable part made of soft high polymer material and provided at its outer periphery with a thick par, and an annular supporting part made of hard high polymer material and provided at its valve seat side with a flange part; and

said valve seat is formed as a protruded part defining a planar surface on a movable valve side and having a thickness approximately equal to that of said flange part.

Sub C1 Cont

84. (New) An ink supply unit according to Claim 34, wherein:

said planar surface of said protruded part and said flange part are located on the same plane.

85. (New) An ink supply unit according to Claim 12, wherein:

said differential pressure valve includes a disc-like movable membrane formed at its center with an ink flow port, a coil spring contacted with said movable membrane, and a valve seat formed as a protruded part defining a planar surface on a movable membrane side and having an outer edge located outside an outer periphery of said coil spring.

B3 Cont

86. (New) An ink supply unit according to Claim 36, wherein:

said movable membrane is formed at its valve seat side with a planar surface and at the opposite surface with a protruded part that supports said coil spring.

87. (New) An ink supply unit according to Claim 12, wherein:

said ink storeroom and an area where said differential pressure valve is accommodated are separated by a wall provided at its bottom part with a communicating hole;

a plurality of electrodes for detecting an ink level are provided in said ink storage chamber; and

Sub C (cont)

at least one of said electrodes is disposed above said communicating hole.

88. (New) An ink supply unit according to Claim 12, wherein:

said differential pressure valve includes a spherical movable membrane provided at its center with an ink flow port, a coil spring contacted with said movable membrane, and a valve seat having a spherical part protruded toward said movable membrane.

B5 cont.

89. (New) An ink supply unit according to Claim 41, wherein:

said valve seat is formed on a wall forming said ink storage chamber.

90. (New) An ink supply unit according to Claim 41, wherein:

said movable membrane and said coil spring are attached to a wall forming said ink storage chamber by a valve fixing frame.

91. (New) An ink supply unit according to Claim 43, wherein:

said valve fixing frame is formed with a passage communicating with a recording head.

92. (New) An ink supply unit according to Claim 44, wherein:

Sub C cont.

said passage includes a groove in said valve fixing frame, and an air intercepting film sealing said groove.

93. (New) An ink supply unit according to Claim 12, wherein:

ink level detecting means is arranged in an upstream side with respect to said differential pressure valve.

B5 cont.

94. (New) An ink supply unit according to Claim 29, wherein:

ink level detecting means is arranged in an upstream side with respect to said filter.

95. (New) An ink supply unit according to Claim 29, wherein:

ink level detecting means is arranged so that said filter is not exposed when an ink end is detected.

96. (New) An ink-jet recording device comprising an ink-jet recording head provided to a carriage, ink supply means, mounted to said carriage, for supplying ink to said recording head, and ink supplementing means for supplementing ink to said ink supply means, wherein:

said ink supply means is partitioned into an ink storage chamber and a valve chamber by a wall provided at its bottom part with an ink inflow port;

Sub C1 Cont

an ink injection port and an air open port connectable to an exterior are provided to said ink storage chamber;

a differential pressure valve opened when pressure in a recording head side is decreased is accommodated in said valve chamber;

said supplementing means is formed as negative pressure generating means for supplying negative pressure to said air open port; and

negative pressure in said ink supplementing means acts on said ink storage chamber to cause ink to flow from said ink cartridge to the bottom part of said ink storage chamber when ink is supplied to said ink supply means.

B5 Cont.

97. (New) An ink-jet recording device according to Claim 50, wherein:

said ink storage chamber is formed with an ink passage that has one end connected to said ink inlet and the other end extended to the bottom part of said ink storage chamber, and that defines such a gap to said ink inflow port to allow air bubbles in inflowing ink to rise by buoyancy and escape said ink inflow port.

98. (New) An ink-jet recording device according to Claim 50, wherein:

capping means sealing said recording head and receiving negative pressure from a suction pump is provided; and

Sub C Cont'd

negative pressure is applied to said recording head via said capping means with said ink injection port and said air open port sealed so that ink in said ink storage chamber is degassed.

99. (New) An ink-jet recording device according to Claim 50, wherein:

capping means sealing said recording head and receiving negative pressure from a suction pump is provided;

B5 Cont'd

negative pressure is applied to said recording head via said capping means in a state in which said ink injection port and said ink cartridge are connected and said air open port is sealed so that ink in said valve chamber is replaced while discharging ink from said recording head.

100. (New) An ink-jet recording device comprising an ink-jet recording head provided to a carriage, ink supply means, mounted on said carriage, for supplying ink to said recording head, ink supplementing means for supplementing ink to said ink supply means, and capping means sealing said recording head and receiving negative pressure from a suction pump, wherein:

said ink supply means is partitioned by a wall provided at its bottom part with an ink inflow port into an ink storage chamber and a valve chamber that accommodates a differential pressure valve opened when pressure in a recording head side is decreased;

said ink supply means is provided with an ink injection port communicating with the bottom part of said ink storage chamber in the vicinity of an upstream side of said differential pressure valve via a passage isolated from said ink storage chamber; and

Sub, Cont

negative pressure is applied to said recording head via said capping means in a state in which said ink injection port is connected to an ink cartridge accommodating degassed ink so that ink in said valve chamber is replaced with degassed ink while discharging ink from said recording head.

101. (New) An ink-let recording device comprising an ink-jet recording head provided to a carriage, ink supply means, mounted on said carriage, for supplying ink to said recording head, and an ink tank for supplying ink to said ink supply means, wherein

B5 Cont.

said ink supply means accommodates an ink storage chamber, an air communicating hole communicating said ink storage chamber with an ambient air, and a differential pressure valve opened where pressure on a recording head side is decreased; and

said ink tank communicates with the ambient air via said air communicating hole provided to said ink supply means.

102. (New) An ink-jet recording device according to Claim 55, wherein:

said ink tank is provided with plural ink chambers; and

said ink tank is adapted to supply ink to said ink supply means sequentially from one of said ink chambers to another.

Sub C' cont

B5 cont.

103. (New) An ink-jet recording device according to Claim 55, wherein:

a space within each ink chamber, from which ink has been supplied to said ink supply means, communicates with the ambient air via said communicating hole.